

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A device, comprising:

a housing having a fixed portion and a first moveable portion defined as a first partial outer surface of the housing and a second moveable portion defined as a partial second outer surface of the housing located opposite to the first partial outer surface, the housing to be grasped by a user and the fixed portion moveable in three dimensions with respect to ground during operation, the first and second moveable portions including pads configured to be selectively moved toward and away each other;

a sensor coupled to the housing and configured to measure positional values of the fixed portion when moved in the three dimensions;

a flexure member coupled to at ~~least~~ least the first moveable portion and the fixed portion, wherein the flexure member is configured to allow selective movement of the first moveable portion with respect to the fixed portion; and

an actuator coupled to the flexure member, the actuator configured to output haptic feedback to the first and second moveable portions of the housing via the flexure member.

- 2 (Cancelled)

3. (Original) The device of claim 1, wherein the haptic feedback is output based on an oscillation of a shaft of the actuator.

4. (Previously Presented) The device of claim 1, wherein the flexure member includes a first flexure member and a second flexure member, the first flexure member and the second flexure member being coupled between the first moveable portion and the fixed portion, the actuator being configured to output the haptic feedback via at least one of the flexure members.
5. (Previously Presented) The device of claim 1, further comprising a manipulandum disposed adjacent to the first moveable portion, the haptic feedback being imparted to the manipulandum.
6. (Currently Amended) The device of claim 1, further comprising a manipulandum disposed adjacent to the first moveable portion, the haptic feedback being imparted to the manipulandum, the manipulandum is fixed in position with reference to the first moveable portion.
7. (Previously Presented) The device of claim 1, further comprising a button disposed adjacent to the first moveable portion, the haptic feedback being imparted to the button.
8. (Previously Presented) The device of claim 1, further comprising a button movable in a
degree of freedom disposed adjacent to the first moveable portion, the haptic feedback being imparted to the button in the degree of freedom.

9. (Previously Presented) The device of claim 8, further comprising a second sensor coupled to the housing, the sensor being configured to detect a movement of the button along the degree of freedom when depressed.

10-11. (Cancelled)

12. (Previously Presented) A device, comprising:

a housing adapted to be engaged to an arm of a linkage mechanism about a pivot point, the linkage mechanism located externally from the housing and configured to suspend the housing therefrom and allow the housing to move in three dimensions relative to ground while suspended thereto, wherein the housing is rotatable with respect to the arm about the pivot point;

a button disposed on the housing and depressible along a degree of freedom;

an actuator coupled to the button;

a first sensor configured to measure positional values of the housing when the housing is moved in any of the three dimensions;

a second sensor configured to detect a displacement of the button along the degree of freedom when depressed; and

a processor coupled to the actuator and configured to send a signal to the actuator based on the detected displacement, the actuator configured to generate a haptic feedback at least along the degree of freedom based on the signal.

13. (Original) The device of claim 12, wherein said actuator is a voice coil.

14. (Original) The device of claim 12, wherein the actuator includes a coil coupled to the button and a magnet coupled to a housing in which the button is disposed.
15. (Original) The device of claim 12, wherein the actuator includes a magnet coupled to the button and a coil coupled to a housing in which the button is disposed.
16. (Previously Presented) The device of claim 12, wherein the second sensor is an analog sensor configured to output a position signal, the position signal associated with a position of the button.
17. (Original) The device of claim 12, wherein the haptic feedback includes a vibratory force produced as a function of time.
18. (Original) The device of claim 12, wherein the haptic feedback includes a spring force produced as a function of the displacement of the button.
19. (Original) The device of claim 12, wherein the haptic feedback includes a damping force produced as a function of a velocity of the button.
20. (Original) The device of claim 12, further comprising a flexure member coupled to the button and a housing in which the button is disposed.
21. (Cancelled)
22. (Previously Presented) The device of claim 12, further comprising: the button being disposed in the housing; and a trackball coupled to the housing, the trackball configured to control a position of a cursor in a display.

23. (Previously Presented) The device of claim 12, further comprising:

the button disposed in the housing; and a joystick coupled to the housing, the joystick configured to control a position of a graphical object.

24-25. (Cancelled)

26. (Original) The device of claim 12, the actuator being a first actuator, the device further comprising a second actuator configured to output a vibration.

27. (Original) The device of claim 12, further comprising an isometric controller configured to control a position of a cursor in a graphical display.

28-29. (Cancelled)

30. (Previously Presented) The device of claim 1, wherein the housing is adapted to be coupled to a linkage mechanism coupled to ground.

31. (Previously Presented) The device of claim 12, wherein the button is integral to a housing having a fixed portion and a moveable portion, the fixed portion and the moveable portion configured to be engaged by one hand of a user.

32-36. (Cancelled)

37. (Previously Presented) A device, comprising:

a housing including a fixed portion and a moveable portion, the moveable portion configured to be selectively depressed toward the fixed portion, the housing engaged to an arm of a linkage mechanism about a pivot point, the linkage

mechanism located externally from the housing and configured to suspend the housing therefrom, wherein the linkage allows the housing to move in three dimensions relative to ground while suspended thereto;

a first sensor coupled to the fixed portion of the housing and configured to provide sensor data regarding movement of the fixed portion of the housing in three dimensions with respect to ground;

a second sensor coupled to the moveable portion and configured to provide sensor data regarding movement of the moveable portion of the housing with respect to the fixed portion of the housing; and

an actuator coupled to the housing, the actuator configured to output haptic feedback to the moveable portion of the housing upon receiving a haptic feedback signal.

38. (Previously Presented) The device of claim 1, wherein the fixed portion is coupled to a linkage mechanism located externally thereto, wherein the fixed portion is at least rotatable with respect to the linkage mechanism.

39. (Previously Presented) The device of claim 41, wherein the fixed portion is coupled to the linkage mechanism, wherein the fixed portion is at least rotatable with respect to the linkage mechanism.

40. (Previously Presented) The device of claim 1, wherein the first moveable portion moves relative to the fixed portion in a direction parallel to the first partial outer surface.

41. (Previously Presented) The device of claim 12, wherein the housing further comprises:

a fixed portion and a moveable portion, the moveable portion defined as an outer surface of the housing, the moveable portion configured to move relative to the fixed portion in a direction parallel to the outer surface of the moveable portion.

42. (Previously Presented) The device of claim 37, wherein the moveable portion moves relative to the fixed portion in a direction parallel to an outer surface of the moveable portion.